

WITNESS GROUP CHAIRMAN'S FACTUAL REPORT
Attachment C: Summaries of Other Information Interviews
(46 pages)

NOTE: Only those contacts whose initial statements to investigators need clarification were interviewed. No interviews were conducted if sufficient explanation had been made in the initial contact. Staff was unable to reach five persons to conduct follow-up interviews.

**SUMMARY OF THEORY INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Russell Alexander

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 9-26-2007

LOCATION: Via telephone

Mr. Alexander called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having a theory as to the cause of the collapse.

Mr. Alexander stated that his experience has demonstrated that crystals under pressure can explode; this includes sand grains and dolomite. The more coarse the grain, the lower the pressure required to make it explode. Mr. Alexander stated that coarse grain sand is used in cement and the resulting explosion of the grain weakens the structure. When vibrations are added, such as those caused by using a jackhammer, the weakened structure collapses.

Mr. Alexander stated that stronger structures result from using fine grain sand, and he recommended the sand grains in the I-35W bridge be tested in a pressure chamber.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Phil Allman

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 10-12-2007

LOCATION: Via telephone

Mr. Allman called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having previous experience with the bridge.

According to Mr. Allman, he crossed the I-35W bridge going northbound at approximately 0630 hours on August 1, 2007 as part of his normal daily commute. Mr. Allman stated traffic slowed as it crossed the bridge and he came to a halt at a flashing sign on the bridge; the sign was warning motorists that the police were conducting active speed monitoring in the area. He was able to further describe the location where he stopped as near the south end of the span in the right lane. He recalls the two outer northbound lanes and the two inner southbound lanes were closed due to ongoing construction.

While stopped, Mr. Allman heard what he described as a loud “KERCHUNK”. He looked for the source of the sound and saw what he described as a backhoe with a stem attachment moving up and down repeatedly on the other side of the concrete divider. The backhoe – which he also described as a “Ditch Witch” – was facing him and he could not see what the stem was striking. Mr. Allman stated there was a ringing sound when the attachment went down; he compared the sound with one he would expect if the attachment were striking a hard surface. He also stated there was no motion, shaking, or movement associated with the ringing sound. Mr. Allman stated the attachment was repeatedly striking the same point and was not moving.

When asked, Mr. Allman stated he did not see, hear, or feel anything else out of the ordinary while on the bridge.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Jim Anderson

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 8-15-2007

LOCATION: Via telephone

Mr. Anderson directly contacted an investigator on-scene and was identified as having previous experience with the I-35W bridge.

According to Mr. Anderson, on the Thursday prior to the collapse, he was under the I-35W bridge. He observed a crack in the concrete in the outside lane, as well as concrete material hanging down.

From: [JANICE ARONE <mailto:----->](mailto:JANICE.ARONE@ILLINOIS.gov)

Subject: 35W bridge

Dear Mr. Taylor:

Following is my account related to the 35 W bridge. I live about 2 miles from the bridge and my job requires frequent travel. I have tried to avoid the bridge whenever possible due to congestion, confusing road pattern changes, and harrowing exits approaching the bridge from the north.

I can pinpoint the date of my incident with reasonable certainty to be 7/12/07. That afternoon I left and appointment on 28th and Chicago at 5:10 pm and traveled north to the Washington Ave. exit where I proceeded to go left onto the 35W bridge going north toward my home.

The traffic was congested, two lanes in each direction. It appeared the southbound traffic had more movement. The northbound traffic was moving very slow with traffic stopped at times. The workers were present with one man within two feet of my car using a cement saw splashing my vehicle. I also felt a lot of movement on the bridge. The sensation was similar to being on a boat and catching the wake of another watercraft when you are still. I could sense it in my abdomen.

My only thoughts were to get off of this bridge and to stay off of it as much as I could during the ongoing construction.

I was also near the collapse at an outdoor restaurant @ St Anthony Main. I did not hear the bridge collapse but did see part of the aftermath.

Please do not hesitate to contact me if you have any further questions. I can be most easily reached at ----- my home office. This number has a private voice mail.

Sincerely,

Janice M. Arone

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Jeff Augustine

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 9-26-2007

LOCATION: Via telephone

Mr. Augustine called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having previous experience with the bridge.

According to Mr. Augustine, he had substantial experience with the I-35W bridge, driving across it every day. At about 1515 hours on August 1, 2007, he was traveling across the span and noticed what he described as “big piles” of a wet material on the bridge in the left-most closed lanes northbound and southbound. He also drove through what he described as “fine white particles” that were wet, like a slurry. When he arrived home, his vehicle was covered in this material; he stated it was caked on to the point that it was difficult to wash off. He went on to state that his wife crossed the span on that day and well, and her car also ended up covered in this material.

When asked if he had heard or seen anything else out of the ordinary, Mr. Augustine stated he had observed “massive” gaps in the decking in the closed lanes about a week prior to the collapse.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Mitch Berg

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 10-10-2007

LOCATION: Via telephone

Mr. Berg called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having previous experience with the bridge.

According to Mr. Berg, he crossed the I-35W bridge three or four times a day prior to the collapse. On August 1, 2007, at approximately 3:50 p.m., he was southbound on the bridge. Mr. Berg stated he thought something was wrong with the bridge, as his car seemed to “wander”. When asked if he could describe his experience in greater detail, Mr. Berg stated it seemed to him as if the pavement was tilted to the right, and he had to “fight” to keep his car in the lane. Mr. Berg went on to state that when he was one segment before the halfway point on the bridge, he struck what he described as a “thump”. He further described the “thump” as crossing onto pavement that was raised approximately one inch.

When asked if he noted anything else unusual that day, Mr. Berg stated there were five piles of gravel on the bridge, and that construction workers were grinding away some of the concrete decking.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Ruth Bettendorf

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 10-17-2007

LOCATION: Via telephone

Ms. Bettendorf called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having previous experience with the bridge.

According to Ms. Bettendorf, she drove across the I-35W bridge on August 1, 2007, just before 1800 hours in her minivan. She stated she was along the upper edge of the bridge, closest to the Guthrie Theater. She then stated this would place her southbound in the outer lane. She describes the traffic at the time as bumper-to-bumper and stop-and-go. She estimated the travel speed across the bridge as 10 to 15 miles per hour.

Ms. Bettendorf stated she was able to observe the ongoing construction activities due to the nature of the traffic. She observed the workers moving drums of some sort of fluid from a flatbed truck. She described the drums as "3 or 4" big blue drums. She believes it might have been change of shift for the workers, as it appeared some were coming onto the bridge and others were leaving. She estimated she observed this activity between one and three minutes before the collapse.

When asked, Ms. Bettendorf stated she did not notice any unusual motion, shifting, or vibration of the bridge.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Dick Burt, City of St. Paul Minnesota Construction Worker
DOB: -----

INTERVIEWER: Jennifer L. Morrison, NTSB - Office of Highway Safety
Sgt. Thomas Stiller, Minneapolis Police Department

DATE: 8-7-2007
LOCATION: City of St. Paul Bldg
873 N Dale Ave
St. Paul, MN

The interviewee was a Reach-All operator and typically drove a Reach-All, while another worker rode in the basket, underneath the I-35W bridge structure. Mr. Burt stated that he has been doing this work for the City of St. Paul for approximately 6 years.

Mr. Burt noted holes in the bridge deck while working on the I-35W bridge in the weeks preceding its collapse. The number and size of the holes that had been drilled into the bridge deck alarmed him. Mr. Burt stated that he drove a Toyota Corolla and he thought that he could have parked his Corolla in one of the holes.

Mr. Burt indicated that the I-35W bridge was always loud and shaky while driving over it, and that this was normal. He said that prior to it collapsing there were jackhammers and also "peckers" on bobcats pounding into the bridge deck. Mr. Burt stated that they (PCI) had been jackhammering constantly in the days leading up to the bridge collapse, but not on the day of the bridge collapse. He stated that the traffic noises were typically too loud for him to hear the bridge making noises from where he sat in the Reach-All. Mr. Burt and stated that he and his co-worker Ron Ekstrand were released from their work of then bridge at about 2:00 pm on the day of the collapse.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Danny Crafton

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 9-26-2007

LOCATION: Via telephone

Mr. Crafton submitted a comment via the NTSB website following the collapse of the I-35W bridge in Minneapolis and was identified as having previous experience with the bridge.

Mr. Crafton is a truck driver for Sunrise Express and had crossed over the I-35W bridge six days prior to the collapse. At that time, he was heading northbound into town in the outside lane. His total load at that time was 79,100 pounds. According to Mr. Crafton, as he got onto the span, the bridge “shook”. When asked to describe the shaking, he went on to state the bridge moved to the left, a “dip” to the left. He further described this motion as “abnormal”.

When asked, Mr. Crafton stated that all lanes were open and there was no active construction on the span at the time. This trip was his first across the span; he had no prior experience with the bridge.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Alan Defrance

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 9-20-2007

LOCATION: Via telephone

Mr. Defrance called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having previous experience with the bridge.

According to Mr. Defrance, he and his father were fishing from the shore under the I-35W bridge on Sunday, July 29, 2007 between 8:30 a.m. and 9:30 a.m. Mr. Defrance stated they heard a loud noise, lasting 15 to 20 seconds, that appeared to originate from the I-35W bridge. When asked if he could locate the sound more specifically, Mr. Defrance stated it came from near the railroad tracks, on the north side, to the left of the cement pillar. Mr. Defrance went on to describe the noise as a “screeching” and compared it to a noise in the movie “Titanic”; specifically, the noise made when the ship begins to bend as it is sinking.

After they heard the noise, Mr. Defrance and his father left the area and did not come back. Mr. Defrance stated there was no active construction on the bridge at the time and he described the traffic as “light”. He stated he did not hear or see anything else out of the ordinary.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Ron Ekstrand, City of St. Paul Minnesota Construction Worker
DOB: -----

INTERVIEWER: Jennifer L. Morrison, NTSB - Office of Highway Safety
Sgt. Thomas Stiller, Minneapolis Police Department

DATE: 8-7-2007
LOCATION: City of St. Paul Bldg
873 N Dale Ave
St. Paul, MN

The interviewee was a Reach-All operator and typically operated the basket of the Reach-All, riding in it underneath the I-35W bridge structure. Mr. Ekstrand stated that he has been doing construction for the City of St. Paul for approximately 16 years. He stated that he has worked on the I-35W bridge multiple times, going back about 12 years. Mr. Ekstrand stated that the City of St. Paul's Reach-All truck was contracted by PCI to work on the I-35W bridge. He stated that when he first arrived to begin work on the bridge in mid-July there were approximately 25 holes of various sizes in the bridge deck. The holes ranged in size from about 2 feet to 20 feet by his estimation. When he arrived on the job site in mid-July PCI workers waved him forward indicating they wanted him to drive the Reach-All over the holes, but he refused, and found an alternate route.

On the day of the collapse, Mr. Ekstrand was in the Reach-All basket under the bridge and had disconnected all of the de-icing tubes going from South to North in the outside Northbound lanes. He then began "stripping the forms" North to South in the outside Northbound lanes. He noted that on the day of the collapse there were no holes, that they had all been patched. When he removed the forms he observed that the new concrete was "bad" and showed "a lot of honeycombing". Mr. Ekstrand further explained that honeycombed concrete is the result of not being vibrated correctly. Mr. Ekstrand felt that the old concrete was better than the newly poured concrete. He pointed out the concrete to John Culver from PCI and according to Ekstrand, Culver also stated that it was not good. Ekstrand stated that has worked with PCI several times over the years and his experience has been that PCI has a "Get-r-done, Get-r-done" attitude.

Mr. Ekstrand indicated that the I-35W bridge was always loud and would rock and sway and that this was normal. He then stated that on the day of the collapse the bridge was unusually quiet and did not rock very much. Mr. Ekstrand and his co-worker Dick Burt were released from their work on the bridge at about 2:00 pm on the day of the collapse. Mr. Ekstrand indicated he considered the I-35W bridge the "most dangerous project" that he has ever worked on. Mr. Ekstrand indicated that when he heard that the bridge had collapsed he was "shocked but not surprised".

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Laura Eldridge

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 9-20-2007

LOCATION: Via telephone

Ms. Eldridge called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having previous experience with the bridge.

According to Ms. Eldridge, she was driving southbound in the middle and left lanes of the I-35W bridge on approximately 8:30 a.m. on June 4, 2007 when she experienced what she described as a “creepy” feeling. She went on to state the bridge rattled in a new way and was also humming. When asked, she described the rattling as a side-to-side motion. She also stated the humming was constant the entire time she was on the bridge. She stated the motion and the humming made her feel unsafe.

Ms. Eldridge stated she had “lots” of experience with the I-35W bridge under different conditions. When asked, she stated there was no construction on the bridge at that time. She also stated she did not hear, see, or feel anything else out of the ordinary.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Cathy Fitzgerald

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 9-25-2007

LOCATION: Via telephone

Ms. Fitzgerald called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having previous experience with the bridge.

On August 1, 2007, between 2:00 p.m. and 3:00 p.m., Ms. Fitzgerald was northbound in the right lane of the I-35W bridge when she experienced what she describes as a “jerk” in a forward/backward direction. When asked if she could clarify what she meant by a “jerk”, she compared it to the sensation experienced when an airplane encounters turbulence. She could not place her vehicle on the span at the time she felt the “jerk” other than to say she was over the water at the time.

When asked, she recalled active construction work being conducted on the bridge, noted she was in the right lane due to that work. She believes they were working on a “big crack” between old and new bridge surfacing. She also stated the “jerk” was very different from the normal vibrations associated with traffic or construction.

**SUMMARY OF OFFER OF HELP INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Tim Galarnyk

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 10-10-2007

LOCATION: Via telephone

Mr. Galarnyk called NTSB Investigator Dennis Collins following the collapse of the I-35W bridge in Minneapolis and offered to help with the investigation by providing knowledge of the construction of the bridge. He was interviewed via telephone on October 10, 2007.

Mr. Galarnyk stated he had discovered a lawsuit had been filed against the Minnesota Department of Transportation (MnDOT) over the construction of piers five, six, seven, and eight of the I-35W bridge. According to Mr. Galarnyk, when MnDOT bid the contract, they represented the area of the bridge footings as sand when, in fact, it was limestone. The contractor subsequently sued MnDOT for a reported \$187,000. Mr. Galarnyk stated MnDOT did not have any information on the lawsuit in its files, but that he was able to locate the details on microfilm in Ramsey County (where the lawsuit had been filed). Mr. Galarnyk offered to provide copies of this material to the Board.

Mr. Galarnyk was referred to NTSB investigator Dan Walsh, Bridge Design Group Chairman, for follow-up.

**SUMMARY OF THEORY INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Dr. Paula Gordon

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 8-15-2007

LOCATION: Via telephone

Dr. Gordon called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having a theory as to the reason for the collapse.

Dr. Gordon suggested that the collapse may have been caused by “sympathetic resonance” as a result of the construction activities, passing freight trains, the wind, or a combination of these factors. She also suggested that the design of the bridge – common in the 1950’s and 1960’s – may have played a part. Dr. Gordon provided written materials in support of her theory.

**SUMMARY OF THEORY INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Bruce Hammer

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 10-2-2007

LOCATION: Via telephone

Mr. Hammer directly contacted and investigator on-scene following the collapse of the I-35W bridge in Minneapolis and was identified as having a theory as to the cause of the collapse.

According to Mr. Hammer, he worked in a laboratory near the north end of the I-35W bridge (on the east bank). Over approximately a year and a half, he observed a "buckling" of the roadway passing under the southbound lanes of the bridge. He described the buckling as being like two speed bumps. He estimated they were between six and eight inches high with one yard between the peaks. The bumps were also approximately 30 degrees from horizontal (perpendicular to the road surface). Following the collapse, girders from the bridge landed on this buckled section of roadway.

Mr. Hammer believes the buckling was caused by erosion and stated he could point out the location of the buckling if needed. He stated he would travel over the buckling a few times a week; the bumps appeared quickly and did not appear to worsen over time.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: John Heitzman

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 10-10-2007

LOCATION: Via telephone

Mr. Heitzman called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having previous experience with the bridge.

Mr. Heitzman was riding his bike under the I-35W bridge from 10th Avenue towards downtown Minneapolis on the Saturday prior to the collapse (July 28, 2007). According to Mr. Heitzman, as he passed under the bridge, he heard what he described as a noise like a “hum”, but louder. According to Mr. Heitzman, the noise was so unusual that he stopped under the bridge to listen. After spending a little time there, Mr. Heitzman could not tell what was causing the noise and continued on.

When asked, Mr. Heitzman stated he had ridden this route approximately ten times before.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Donna Jacobson

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 9-20-2007

LOCATION: Via telephone

Ms. Jacobson called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having previous experience with the bridge.

Ms. Jacobson was returning to Minneapolis via southbound I-35W in February 2007. According to her, as soon as she crossed onto the I-35W bridge span, she felt what she described as a “sideways slipping”. She went on to describe the motion of the bridge as “jiggling” side-to-side with little up and down movement. She made it across the bridge without further incident and continued southbound on I-35W. She stated the motion of the bridge made her want to avoid it in the future, and she did, with this trip being her last across the bridge prior to the collapse.

When asked, Ms. Jacobson did not recall any construction on the bridge at that time. All four lanes in the southbound direction were open, and she was in the 2nd lane to the right.

**SUMMARY OF THEORY INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Chritiane Joost-Guaugier

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 10-10-2007

LOCATION: Via telephone

Ms. Joost-Guaugier called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having a theory as to the reason for the collapse.

Ms. Joost-Guaugier is an architectural historian. She has looked at the construction of arches throughout history and believes that a more circular, higher arch is safer. In contrast, a flat, wider arch would be more dangerous as more of the thrust is directed outward. She notes that the I-35W bridge had wide span arches, and she considers this a design flaw.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Faith Kidder

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 9-26-2007

LOCATION: Via telephone

Ms. Kidder submitted a comment to the Minnesota Department of Transportation (MnDOT) that was forwarded on to the NTSB. She was identified as having previous experience with the I-35W bridge.

According to Ms. Kidder, she had significant experience with the I-35W bridge, crossing it at least once every two weeks for 25 years. On July 11, 2007, at approximately 1345 hours, she was northbound on the bridge when she experienced a sensation she described as “floating”. When asked if she could clarify her experience, she stated the motion was lateral (side-to-side), the roadbed felt unconnected, and compared the experience to going over a wooden bridge when hiking.

When asked, she recalled that there was active construction on the bridge at that time, with one lane open in her direction of travel. She described the traffic as “stop and go”. When asked if she could recall her position on the bridge, she first estimated she was two-thirds of the way across, then later stated she was approximately 25 yards before the northbound exit to University.

Ms. Kidder also stated there was a mild breeze that day.

**SUMMARY OF THEORY INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Lawrence Lopresti

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 9-26-2007

LOCATION: Via telephone

Mr. Lopresti called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having a theory as to the cause of the collapse.

Mr. Lopresti stated his initial call to the toll-free number was seeking information, but that he had been able to get it directly from MnDOT, among others. Mr. Lopresti stated that according to this information, the U10 and L11 gusset plates were one-half inch thick. Pictures in the media show the U10 plates, which he described as “shredded”. He went on to state that this may not have been the cause of the collapse, but he believes it certainly was a factor. He suggested investigators look closely at the pier/footer connection for shifting, as the apparent pier movement was “unusual”.

Mr. Lopresti went on to describe the following scenario: on a hot day, given the bearings were locked, the south side piers could have snapped off their heads, resulting in a 3 inch drop. He stated victim experiences reported in the press would be consistent with this scenario.

Mr. Lopresti also stated that the gusset plates were not looked at or analyzed as part of the inspections. His calculations indicate U10 had the highest tension of any gusset, and may have experienced a “Von Mises” condition, whereby a plate fails due to being in compression and tension at the same time.

**PERSONAL ACCOUNT
OF
MY TRAVEL OVER I-35W BRIDGE CROSSING THE MISSISSIPPI RIVER IN MPLS, MN
IN HOURS PRECEDING THE COLLAPSE
AT 6:05 PM ON AUGUST 1, 2005**

**JEANETTE MANORE
Lindstrom, MN**

August 4, 2007

INTRODUCTION:

I was traveling on this I-35W bridge in the hours just prior to its collapse on August 1, 2005. As I watched the news coverage of this incident unfold, and knowing I (along with countless others) were so close to possibly not being home to watch the news coverage that evening, I am compelled to document the things I noticed during both my crossings that afternoon, and submit them to NTSB.

My hopes are that my first-hand observations might provide some additional clues to assist the investigators tasked with determining its cause.

Please refer to the following pages for details.

CHRONOLOGY

AT APPROXIMATELY 12:41PM – 12:47PM LOCAL TIME

- I was traveling SOUTHBOUND on I-35 over the bridge trying to deliver a 500lb farm implement I had in the pick-up by 1:00pm local time.
- I was in the 2nd lane from the west
- Traffic was moving at approximately 10 – 20 mph
- At the location indicated on Image 1, traffic was at a complete stop, and I began to experience a noticeable circular motion/oscillation on the front end of my pick-up that was horizontal and counter-clockwise in nature. This struck me as odd, as I have travelled this very route over this very bridge for 20 years to and from work in SE MPLS, and in all types of traffic conditions (including stopped traffic), and I have never felt such an uncomfortable sensation as this. In fact I distinctly recall two thoughts I had at this moment:
 1. How can these guys work with this kind of movement going on; and
 2. ...I hope this bridge doesn't collapse.
- Another item that caught my attention was the seemingly endless clutter of construction equipment that appeared parked in the 2 left-most SB lanes (starting from the 8th street overpass southward to the Washington / Hiawatha / 35W interchange). In fact it seemed excessive.



Image 1 I-35W Mississippi River Crossing (SB Leg)

Approximate location during SB travel – Experienced a noticeable sway that was horizontal and counter-clockwise in motion.

AT APPROXIMATELY 2:15 – 2:25 PM NORTHBOUND

- Was traveling NB over bridge on my way home. No weight in the back of my pick-up.
- Windows were down (my A/C did not work)
- NB traffic was not as heavy as the earlier SB traffic, and we were traveling about 30 mph.
- At the position indicated in Image 2 below, I first heard some very definitive steel-on-concrete sound that I can only describe as a “pang”:
 - It did not have any after-sound like one would hear when dropping a heavy steel tool on concrete, which typically has 2 – 3 subsequent bounce sounds.
 - And there were no workers to my left that I could see to drop anything
 - There were 3 distinct instances of this sound, (and a questionable 4th) over a duration of approximately 3 – 5 seconds.
- Which followed immediately by the sound like my wheels were flinging large-size rocks into the underside of the pick-up, predominantly in the area of the cab...one of which I felt hit beneath the floor-board of my right foot.

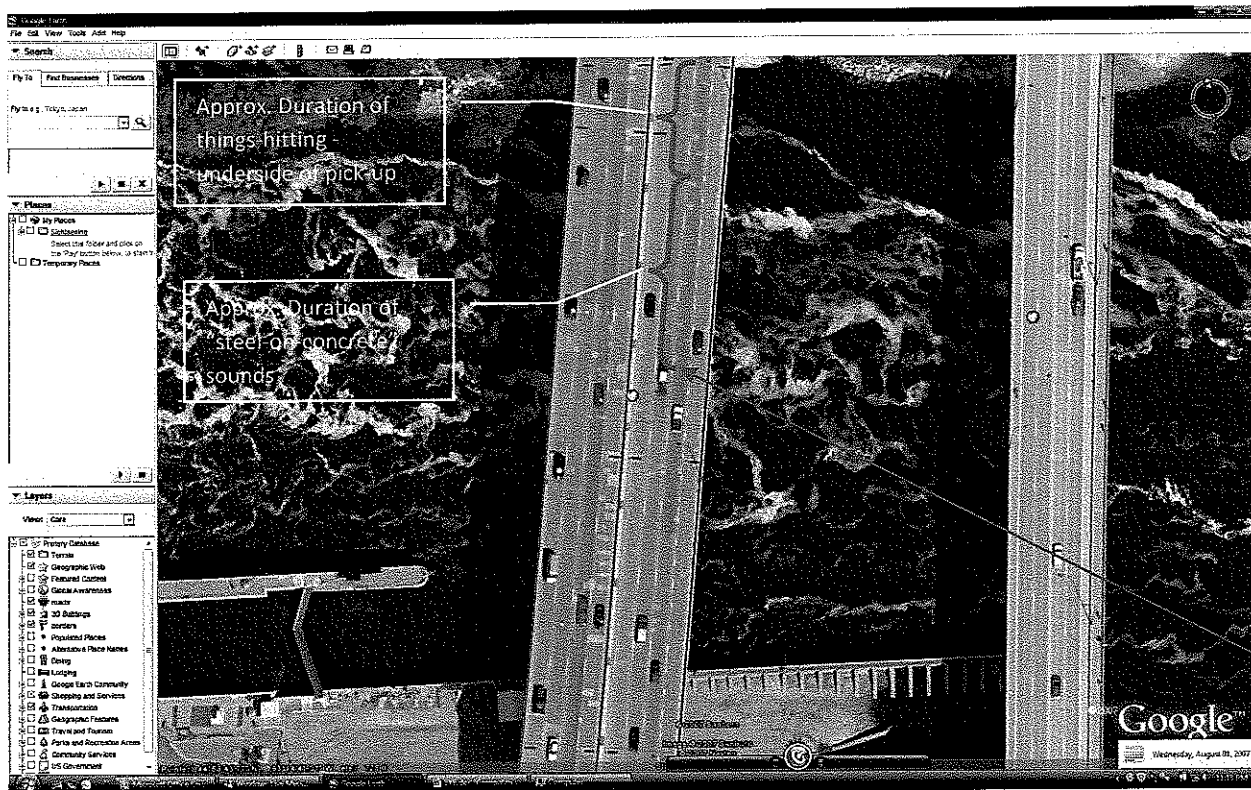


Image 2 I35W Mississippi River Crossing (NB Leg)

Approximate location during NB travel – heard very sharp, loud panging noises, and then noticed items like stones hitting the undercarriage of the truck. My windows were open.

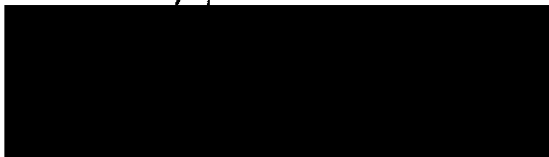
MY VEHICLE:

The vehicle I was traveling in during both crossings was a:

- 1999 FORD 150,
- TIRES - GOODYEAR ALL TERRAIN RADIALS 255 - 15 INCH RIMS.
 - Pressure at 42psi because I was hauling a 500lb SICKLE MOWER
 - During the southbound leg I was hauling the sickle mower
 - During my northbound travel the truck was empty.
- A/C DID NOT WORK SO WINDOWS WERE OPEN

I hope you find this information helpful to your investigation of the collapse. If you need any further information, or clarification on any part of my account, please feel free to contact me at your convenience.

Respectfully;



Jeanette M. Manore

Lindstrom, MN

 (home)
(cell)

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Bob Mendenhall

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 10-10-2007

LOCATION: Via telephone

Mr. Mendenhall called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having previous experience with the bridge.

According to Mr. Mendenhall, for the past 20 years, he had a 23-mile, one-way daily commute that took him across the I-35W bridge. On August 1, 2007, he was northbound on the bridge between 5:45 and 6:00 p.m. He stated he was in the left lane.

Mr. Mendenhall described the traffic as “heavy” and “stop-and-go”. He recalled that he came to a complete stop once. Mr. Mendenhall believed that the level of traffic was high given the bridge was under construction and the weather was hot. He observed what he described as three moderately sized piles of debris. He stated it looked as if the piles were comprised of material milled from the roadway. He also noted that construction equipment was parked on the bridge.

Mr. Mendenhall cleared the span and exited I-35W at the East Hennepin Avenue exit, the second exit after the bridge, between 6:00 and 6:10 p.m.

**SUMMARY OF THEORY INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Glenn Miller

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 8-15-2007

LOCATION: Via telephone

Mr. Miller directly contacted an investigator on-scene and was identified as having a theory as to the reason for the collapse of the I-35W bridge.

Mr. Miller works for Centerpoint Energy, in a water treatment plant near the I-35W bridge. On the Tuesday before the collapse, he was in the control room, which looks out under the bridge. He observed what he described as a “new, black, SUV” with all windows tinted. In the vehicle were two men he described as wearing suits, sunglasses, and earpieces. According to Mr. Miller, the vehicle was there for approximately twenty minutes. He was not able to observe the license plate of the vehicle. He did not observe any activity other than the vehicle sitting there.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Craig Miskell

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 9-20-2007

LOCATION: Via telephone

Mr. Miskell called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having previous experience with the bridge.

According to Mr. Miskell, he works as a delivery truck driver and had crossed the I-35W bridge between four and six times a day for twelve years. On August 1, 2007, at approximately 1525 hours, Mr. Miskell was southbound on I-35W, approaching the bridge over the Mississippi river. According to Mr. Miskell, as he crossed the first expansion joint, there was a gap of approximately one-half to one inch, covered with what he described as black construction paper. Passing over this gap resulting in a "bump". Mr. Miskell experienced a similar bump on the other side of the bridge, at what he described as the last expansion joint.

When asked, Mr. Miskell stated he believed that both "bumps" were up; that is, resulted from his truck crossing from a lower point to an upper one. He stated he was sure the second bump was clearly "up". He further stated that he detected no unusual motion of any kind while on the bridge.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Vince Netz

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 10-10-2007

LOCATION: Via telephone

Mr. Netz called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having previous experience with the bridge.

On August 1, 2007, at approximately 1753 hours, Mr. Netz was southbound in the left lane of I-35W. As he crossed onto the part of the I-35W bridge not directly supported by the ground, he noticed the bridge was moving more than normal. When asked, he described the motion as up and down, not violent, but noticeable.

Mr. Netz stated jack hammering was not going on at the time, and went on to state that the motion he experienced was not the motion normally associated with the on-going construction. He stated he crossed the bridge five times a week on average.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: William Ochu

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 9-26-2007

LOCATION: Via telephone

Mr. Ochu called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having previous experience with the bridge.

Mr. Ochu stated he traveled southbound across the I-35W bridge twice on August 1, 2007. The second time he crossed the span - approximately 1700 hours – he recalls being in the far left lane. Construction was underway. According to Mr. Ochu, there was active construction on the bridge at the time. He noticed the expansion joints for the bridge had been removed and he could see the water below. He stated he experienced the feeling that the bridge was “floating” as well.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: James Pacala

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 9-26-2007

LOCATION: Via telephone

Mr. Pacala called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having previous experience with the bridge.

According to Mr. Pacala, he runs twice a week along a route that took him under the I-35W bridge, and had done so for the past five years. On August 1, 2007, at approximately 1100 hours, Mr. Pacala was running upriver, towards the lock. As he passed under the east façade, he observed what he described as a “six foot band” where it looked as if someone had “sprinkled metal filings” across the path. His initial thought was that the filings were from welding conducted on the bridge. He went on to describe the filings as “dark, gun-metal gray” with no rust visible. He estimated they were 3 to 8 millimeters long and one millimeter in diameter.

When asked, he did not recall hearing or seeing anything else unusual that day.

**SUMMARY OF THEORY INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Gary Runco

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 10-3-2007

LOCATION: Via telephone

Mr. Runco called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having a theory as to the reason for the collapse.

Mr. Runco stated that there had been a hydroelectric plant just upstream of the dam on the north side of the river. According to Mr. Runco, this plant was demolished because the foundation eroded. He believes this relates to the collapse of the I-35W bridge because the bridge was only approximately 1000 feet from the plant's former location.

Mr. Runco believes that erosion of the piers would change the loading on the members. He stated that it appears in pictures that the north pier seems to have shifted. Mr. Runco has previously worked as an instructor for the FHWA in the area of bridge inspection.

Mr. Runco was also able to provide two pictures taken when he was performing work on the St. Anthony's Lock and Dam.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Stephen Schweckendieck

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 9-20-2007

LOCATION: Via telephone

Mr. Schweckendieck called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having previous experience with the bridge.

According to Mr. Schweckendieck, on July 30, 2007, he and a friend were riding their bikes on the bike path on the south side of the river. It was a hot day, and they stopped in the shade under the I-35W bridge. While stopped, Mr. Schweckendieck noticed what he described as two or three large holes in the concrete bridge decking. He stated the holes were longer than they were wide, and that he could clearly see rebar and sky through the holes from 50 feet below. He estimated the holes were 15 to 20 feet long, with 10-15 rows of rebar visible across the hole and more visible front to back.

When asked, Mr. Schweckendieck stated he could hear jackhammering coming from the bridge. He also stated he observed no motion of the bridge.

**SUMMARY OF THEORY INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Karin Smith

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 10-3-2007

LOCATION: Via telephone

Ms. Smith called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having a theory as to the reason for the collapse.

According to Ms. Smith, the father of a man she had dated had, in her words, “paid off” bridge inspectors to pass or certify unsafe bridges; she is unsure if the I-35W bridge was one of those bridges. She provided the name of her boyfriend’s father as Frank Tortello. She went on to state that Mr. Tortello’s construction company was St. Michael’s construction and that the FBI might be investigating another bridge, the Tortello bridge. She also stated that there might be a connection between Mr. Tortello and Mr. Dan Dorgan of MnDOT.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Randy Vandeloo

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 9-20-2007

LOCATION: Via telephone

Mr. Vandeloo called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having previous experience with the bridge.

According to Mr. Vandeloo, he was traveling on West River Road, under the I-35W bridge on August 1, 2007, approximately 30 to 40 minutes before the collapse. He stated he travels this route twice a day as part of his commute. He stated he heard construction on the bridge every day for the previous few weeks. On August 1st, Mr. Vandeloo encountered what he described as “little bits of concrete”, ranging in size from dimes to tennis balls, on West River Road. He went on to state he had to actively avoid the larger pieces.

When asked, Mr. Vandeloo stated he did not look at the underside of the bridge.

**SUMMARY OF THEORY INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: David Verness

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 10-2-2007

LOCATION: Via telephone

Mr. Verness submitted a comment to MnDOT following the collapse of the I-35W bridge in Minneapolis and was identified as having a theory as to the cause of the collapse.

Mr. Verness stated that some sort of spray or brine solution is used on the bridges to keep them from icing. He believes this material leads to rusting of the structural members of the bridges. As a solution, he proposed putting the spray into cars, allowing the Anti-lock Braking System (ABS) sensors detect slipping and automatically pump the heated spray onto the tires. He believes this would result in less brine being used.

Mr. Verness stated that rain tires, designed to be wet, would have to be used with his system. He further stated the result would be similar to the traction experienced by a Zamboni machine.

He also believes the Lafayette Bridge is in much worse condition than the I-35W bridge.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Annette Vitale-Salajanu

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 9-26-2007

LOCATION: Via telephone

Ms. Vitale-Salajanu called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having previous experience with the bridge.

According to Ms. Vitale-Salajanu, she was driving from St. Louis Park to the Christian Brothers School on either the Sunday or the Monday around Memorial Day, 2007,¹ and had occasion to cross the I-35W bridge. She stated that as she drove onto one section of the bridge, the opposite end went up and came down as she continued to drive. She estimated the rise as anywhere from 3 to 8 inches. When asked if she could provide a further description of the motion of the bridge, she stated the whole bridge “shook” or “bounced” in an up/down motion.

When asked, she stated she believes she was in either the right or second from right lane. She recalled no active construction at the time, although she did state there was construction equipment on the side of the road.

¹Therefore, either May 27 or May 28, 2007.

**SUMMARY OF THEORY INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Brian White

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 9-26-2007

LOCATION: Via telephone

Mr. White called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having a theory as to the cause of the collapse.

According to Mr. White, he is a structural engineer and began investigating structural failures in 1957. He stated news coverage on the second day following the collapse reported the south end of the span shifted 51 feet to the east with the rest of the bridge coming straight down. Based on this report and the pictures he's seen, Mr. White believes the foundation of the bridge in this area should be treated carefully, as this is where the collapse began. He suggested conducting a chemical analysis of samples from the footings of the piers in this area.

Mr. White went on to state he believes the addition of "cement fondue" to the bridge contributed to the collapse. He defined "cement fondue" as Aluminum Oxide (Al_2O_3). He stated the I-35W bridge had collapsed after approximately 40 years, and provided three examples of other concrete structures failing in the same amount of time – a church in England, a Canadian highway, and the Ottawa Stadium.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Phillip White

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 9-20-2007

LOCATION: Via telephone

Mr. White called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having previous experience with the bridge.

Mr. White stated he crossed the I-35W bridge on August 1, 2007, approximately 10 minutes prior to the collapse. He had come onto I-35W northbound from Washington Avenue and entered the left lane. He noted construction had closed two of the four lanes. He estimated the speed of traffic as between 5 and 10 miles per hour and described the density as bumper-to-bumper.

As Mr. White approached the halfway point of the span, he noticed what he described as sizable sand piles on the southbound side, near the median. He noted the piles were so large that he had to look up at them from his Audi A6. He remembers the piles, as it seemed to him to be a lot of sand.

When asked, Mr. White recalled nothing else out of the ordinary on the bridge that day.

**SUMMARY OF THEORY INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: James Widder

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 9-26-2007

LOCATION: Via telephone

Mr. Widder called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having a theory as to the cause of the collapse of the bridge.

When contacted, Mr. Widder began by placing his theory in context. He stated he had been northbound in the right lane of the I-35W bridge at approximately 1300 hours on August 1, 2007. At that time, he observed what he described as a “lot, more than 60” construction workers on the bridge. He specifically stated this was more workers than he’d seen before. According to Mr. Widder, the workers were pulling tarps over a fresh concrete pour. Mr. Widder stated it was very windy at the time, and he speculated that the additional construction workers were needed to hold the tarps. When asked, he stated the winds were out of the West-Southwest, and described them as “strong”.

Mr. Widder then described his theory. He stated that the gorge in the area focuses the winds, subjecting the bridge to wind loads and gusts. The concrete deck and the steel substructure react to this loading as a composite structure. He believes the cross-bracing on the bridge, in the plane of the decking, suffered from poor welds. When the wind load that day was combined with the holes on the bridge (from the milling and removal operation) and the loading of a fresh concrete pour on the windward side, it caused a section of the bridge to fail. Mr. Widder advised investigators should look for “crimping” of the rebar on the windward side of the bridge.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Adam Widdicombe

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 9-20-2007

LOCATION: Via telephone

Mr. Widdicombe called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having previous experience with the bridge.

According to Mr. Widdicombe, his work as a background investigator resulted in significant experience with the I-35W bridge. On August 1, 2007, he completed three round trips across the bridge. His first trip across occurred at approximately 1030 hours. Mr. Widdicombe stated he was southbound in the right lane and observed twenty-five to thirty construction workers on the bridge. Mr. Widdicombe stated the workers were removing concrete strips approximately three to four feet wide across the width of the two closed lanes. . He went on to state he believes the workers were cutting through the rebar.

Mr. Widdicombe stated he observed similar activity when he crossed the span on his return trip, at 1145 hours, and again at 1215, 1245, 1600, and 1715 hours. When asked if he saw, felt, or heard anything else out of the ordinary, he stated he felt a little “give” in the bridge deck but described the motion as normal, like when a semi tractor-trailer was driving on the bridge.

**SUMMARY OF PREVIOUS EXPERIENCE INTERVIEW
CONCERNING THE I-35W BRIDGE COLLAPSE**

INTERVIEWEE: Jerry Young

INTERVIEWER: Investigator Dennis Collins, NTSB Office of Highway Safety

DATE: 9-20-2007

LOCATION: Via telephone

Mr. Young called the toll-free number established by the Board following the collapse of the I-35W bridge in Minneapolis and was identified as having previous experience with the bridge

According to Mr. Young, he is a truck driver with 13 years of experience. He stated he was northbound on I-35W some time in the 10 days prior to the collapse of the bridge. Mr. Young stated he had just driven onto the span in “stop and go” traffic when the bridge “dropped” and gave a “big jolt”. Mr. Young described the experience as if something in the bridge was binding, then suddenly let loose.

When asked, Mr. Young estimated he was approximately 30 feet onto the span when it dropped. He further stated he noticed nothing else out of the ordinary prior to the drop.